ABSTRACT

Ground conductors 4g and 5g, a transmission-line conductor 4a and a coupling-line conductor 4k are formed on a dielectric substrate 3. A dielectric-filled waveguide includes a lower conductor plate 1, an upper conductor plate 2, a lower dielectric strip 6, and an upper dielectric strip 7, where the dielectric substrate 3 is sandwiched between the lower conductor plate 1 and the lower dielectric strip 6, and the upper conductor plate 2 and the upper conductor strip 7, so that a conductor part S that is part of the ground conductors of the dielectric substrate forms a shield area of the dielectric-filled waveguide. The coupling-line conductor 4k is coupled to a standing wave caused by the shield area, at a position where the electric-field intensity of the standing wave is high. Subsequently, a plane circuit can be provided, so as to be parallel to the direction in which an electromagnetic wave propagates through the three-dimensional waveguide. Further, the dielectric substrate can be easily machined and the characteristic of coupling between the plane circuit and the three-dimensional waveguide provided on the dielectric substrate is prevented from being affected by the precision of assembling the plane circuit and the three-dimensional waveguide so that a line-conversion characteristic according to predetermined design can be easily obtained.